



IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF:

:

Paolo Baracchini et al.

: EXAMINER: Simon J. Oh

SERIAL NO: 09/419,891

FILED: 10/18/1999

: GROUP ART UNIT: 1615

FOR: THERMOINSULATING MAT OF MINERAL FIBERS WITH RANDOM
ORIENTATION

DECLARATION OF VALERIE DUPOUY

JUL 29 2004

I. **Qualifications**

TECH CENTER 1600/2900

1. I am a researcher at the SAINT-GOBAIN ISOVER research center C.R.I.R., 19 rue Emile Zola , Rantigny 60290, France. I have an Engineer degree and a Ph.D. in Combustion science. I have worked for Saint-Gobain Isover since 1995, on many projects directed to improving mechanical properties of insulation products, where I gained expertise in process operations affecting the fiber structure of the products, such as the crimping process. I am now Technical Coordinator for Mechanical Products & Ageing in the International R&D organization in Isover.

II. **Experiments**

2. I conducted experiments concerning the crimping method, which consists in applying longitudinal compression to a fibrous mat for insulation, particularly

the forming method described and claimed in US Patent N° 4,632,685 (“the ‘685 patent”), which was granted to Debouzie et al.

3. In order to impart mechanical resistance to a fibrous insulation product, it is required to modify the orientation of fibers in the product, which is normally consisting of parallel “strata” of fibers arranged in an essentially horizontal way.
4. Where a vertical direction is given to at least part of the fibers in the product, the compression strength of the product increases.
5. The crimping method is used to provide such a fibrous structure in the product: by receiving the mat in conveyors with a lowered speed (as compared with the speed of the conveyors driving the mat upstream), one causes a longitudinal compression at the place where the speed drop occurs, the result of which is that some fibers arrange in a more or less vertical orientation.
6. It has been observed that, for a given product, when the longitudinal compression rate rises, it can be so high that the re-orientation is similar to a pleated ribbon with undulations. However, such orientation is detrimental to the longitudinal tensile strength and should generally be avoided in the final product.
7. The method described in the ‘685 patent enables to achieve high compression rates, and high mechanical performance due to :
 - the fibers size, especially short fiber length,
 - the limited compression rate at each stage of the longitudinal compressing.
8. In particular, the compression rate at the first crimping stage is determined by the

speed ratio between the speed of conveyors 7,8 (35 m/min according to column 10, line 38) and the speed of conveyors 9,10 (18-20 m/min according to column 10, line 41) which is about 1,75 to 1,95. For fibers of around 1 to 3 cm in length, this not sufficient to provide undulated fibrous structure which affects the entire thickness of the felt.

9. From the parameters generally disclosed in the '685 patent, no pleating would be observed in any embodiment.
10. A pleating of the felt would be possible at the first stage of the double crimping machine, if those parameters are modified outside the teaching of the '685 patent, with higher fiber length and/or a higher compression rate at the first stage.

I declare that the foregoing is true and correct.

Executed on _____ (Date).

Valérie Dupouy
